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This paper discusses and review the ideas of Hoyt L. Sherman who taught art and visual perception at the Ohio State University. It explores some of the psychological sources for his work and ideas about the teaching of drawing by seeing which relates to the work and ideas of Adelbert Ames, Jr. The article traces the influences of both Ames and Sherman on art and design education in this country. It compares Sherman's methods with those of Betty Edwards and Mona Brookes in the teaching of drawing as a cognitive skill. The article concludes with some thoughts about Sherman's ideas as an early forerunner of current thinking in computer art, electronic music, and the nature of the telematic culture. (Author)

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HOYT SHERMAN, ADELBERT AMES, JR. & BETTY EDWARDS

ON

DRAWING AND SEEING

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ABSTRACT

This paper will discuss and review the ideas of Hoyt L. Sherman who taught art and visual perception at the Ohio State University. It will explore some of the psychological sources for his work and ideas about the teaching of drawing by seeing which relates to the work and ideas of Adelbert Ames, Jr. The article will trace the influences of both Ames and Sherman on art and design education in this country. It will compare Sherman's methods with those of Betty Edwards and Mona Brookes in the teaching of drawing as cognitive skill. .The article will conclude with some thoughts about Sherman's ideas as an early forerunner of current thinking in computer art, electronic music, and the nature of the telematic culture.

(Quote)

"For someone working in the ivory tower of art and aesthetics, all these ideas (about color, sound, and space) are of course subservient to whim, taste and artistic vision. Fine art has never felt compelled to follow any laws and we can only hope, never will. Still, the idea of proportion has always been a useful tool for the skilled craftsman, something every good artist must be." (Evan, 1988 Leonardo pp. 29)

HOYT SHERMAN AND ADELBERT AMES, JR.

The subject for this essay is the long time Ohio State University Professor, Hoyt L. Sherman. As a part of the preparation for this research I have corresponded with former students of Sherman, all of whom speak of him as one of the most significant events in their artistic development.

Sherman wrote one book, Drawing by Seeing (1947); a book not unlike Betty Edwards' now very popular work, Drawing from the Right Side of the Brain (1978). We will look at Sherman's book as a part of this essay. He was a painter, but above all he was a teacher of art at Ohio State University for over 50 years. Sherman went to Ohio State as a young graduate student in the early 1920s and remained until his final retirement in the mid 1970s. He received many university honors but was really not well known beyond the confines of Columbus, Ohio. Sherman taught painting, drawing and visual perception, to entire generations of fine arts students who for decades went out from Columbus, Ohio to spread the word and to staff the art departments of many of the major universities.

This writer first met Hoyt Sherman in the early 1950s when still a student at the School of the Art Institute of Chicago. The students were all ushered into the auditorium to listen to a rather funny little man. He spoke about color and a color organ, a device upon which one could play out many possible color variations on a display screen. Most of us did not think about his presentation, for it seemed to be a sort of Bauhaus like approach.

For the art student in the early 1950s, the approach of Sherman with its' emphasis on psychology and on the principle of perception, was too conceptual and lacked the spontaneity of the gesture and the action painting of Jackson Pollack. For those who listened to Sherman talk about color, he was not of the avante-garde. The students who listened to him, this writer included, were fine arts rather

than design oriented.

Even then Sherman was ahead of his time, the date of his Art Institute lecture was 1950, Rudolf Arnheim would publish his epic and revolutionary book on art and perception in 1954. (Arnheim, 1954)

As I look back upon Sherman's color organ, I now realize he was far ahead of this time. His idea for color organ can now be recognized as an exercise in color computer graphics. A part of many of the new color computer graphic programs is the ability to see upon the display screen all the possible color variations that are obtainable by a software program. Sherman was doing similar operations with his color organ which demonstrated that he was about 40 years ahead of his time.

Sherman's idea for his color organ was to create a device (to my knowledge he neither built his machine nor wrote about his ideas in detail) that one could "play" like a piano and instead of sound, the mechanical action of the instrument would produce colors displayed upon a TV screen. The computer graphic artist of today, "playing" on his keyboard or digital pad display on his monitor hundreds and thousands of colors in much the same fashion as Sherman fantasized then in 1950. There is no evidence that Sherman had a practical means of achieving his idea.

What then were the sounds of Sherman's work and ideas?

Evans has observed in the general Electronic Art Supplement of Leonardo (1988, pp 27-29) that in the search for harmonious color many conflicting ideas have been offered to the artist and designer. With a borrowing of the concept of harmony from music some theorists sought to map concepts of Western tonal music directly to the color domain. Others dismissed the possibility of direct correlation as frivolous at best, based on emotional considerations and inconsistent from one artist to the next.

"While there appear to be no scientific relationships between percepts of color and sound variations, evidence indicates that a large percentage of people experience color when listening to music. This color-hearing or synesthesia by itself does not seem of practical use of the artist, but it encourages continued explanation of color/music relationships." (Evans, 1988, pp 27)

The conception of proportion has been acclaimed as the basis for associating color with music. This I think was clearly in evidence in Sherman's thought when he talked about the color organ in 1949.

Influence of Adelbert Ames, Jr.

One of the basic conceptual sources of Sherman's ideas lay in the psychological and perceptual experiments of Adelbert Ames, Jr. (1880-1955). Roy Behrens (Behrens, 1987) has written on the work of Ames and goes into some detail as to the influence of Ames on the work of Sherman. As Behrens points out, Adelbert Ames, Jr. (1880-1953) was an American ophthamologist and perceptual psychologist, who initially wished to be a visual artist, and is credited with the discovery of aniseikonic. As a psychologist he is remembered as the inventor of the Ames Demonstrations in perception, a collection of visual illusions which related to a wide range of perceptual illusions. (Leonardo Vol. 20, No. 3, pp 273-279, 1987)

In 1910 Ames and his sister began to paint. His goal was to be able to make exact color reproductions of scenes and to that end he devised one of the first systems of color notation which involved the mixing of 3,300 different color variations of 27 hues, 15 gradations in value, and 10 steps of intensity (Chroma). Was this the source for Sherman's later idea of the color organ?

Ames Experiment (after World War I)

Behrens has observed that Ames' experiments with binocular photographs were rough simulations of ideal paintings of stereoscopic photographs. It was such research which led to the discovery of aniseikonia, a malfunction of the eyes, which in turn led Ames to the development of his demonstration in perception. Almost all of the Ames demonstrations are examples of anamorphosis, a kind of distortion that artists have used since it was invented by Leonardo in about 1485. (Baltrusaitis, 1977)

Ames (Ames, 1923) published an early paper entitled "Vision and the Technique of Art" which described the studies of Leonardo and the devices used by artists to look at paintings. At this time Ames was at Clark University working on his research in optics and psychology but as this paper atests, he was still concerned with the visual problems, the artist came involved with his own work as a painter.

Who might have influenced Ames in his art and design studies? Although I have no direct evidence, I have come to believe that it might have been Denman Ross of Harvard University who published several books about color and design. (Ross, 1917) Ross taught design at Harvard and was will known in the Boston area at the time as a collector and painter of landscapes. Ross's ideas were consistent with the directions taken by Ames in his research on color and perception.

Behrens has pointed out that linear perspective presupposes a perpendicular picture plane, while anamorphosis presents us with an oblique plane in the place of being perpendicular. Most of the Ames demonstration and examples of anamorphosis in that they consist of oblique planes which are mistakenly seen as perpendicular. (Behrens, pp. 277)

Ames and Sherman

While Ames was at work at Dartmouth in 1930s and 1940s, Sherman was exploring the use of a technique to train football players and air plane spotters in the early 1940s. Sherman sensed that this method of perceptual learning could be applied to problems of seeing in the teaching of drawing. He visited Ames at Hanover who traveled to Columbus, Ohio and together with Ron Mooney at the Visual Demonstration Center at Ohio State University.

Ames published in 1923 an important article in The Art Bulletin (Vol. 8, pp. 5-26) with the title "Depth in Pictorial Art". In that article Ames tried to connect his own experience as a painter with his interest in optics and perception. In his paper Ames stated a basic thesis that the extent of the illusion of depth that one may get from a given picture depends upon which of several means one used to review it. The most useful effect is by the use of a mirror or of a combination of lenses and prisms. In this report Ames' explanations were a continuation of the artist's concern with pictorial illusions that have dominated Western Art since at least the Renaissance. Ames' habit of looking at art with a depth lens directed his subsequence interests in the nature of depth perception which became the basis for many of the demonstrations in the Visual Demonstration Center both at Dartmouth and Ohio State. Some of the insights from this article must have found their way into Sherman's later analysis of Cezanne. Unfortunately his Cezanne book was not published and exists in draft form only at the Ohio State Library which has a collection of Hoyt Sherman's papers. (2)

Hoyt Sherman's major work was the now long out of print book, Drawing by Seeing (1947). The book basically describes the program in the teaching of drawing which Hoyt Sherman pioneered and taught for many years at the Ohio State University. Sherman designed and built what was known as "the flash lab". This

was a room that could be blackened and was equipped for the projection of images upon a large screen. These were not ordinary slide images and the room was not designed for the typical University art slide lecture or art studio drawing class. The images were all simple lines, shapes, forms, textures and color not unlike material found in the typical textbook on Gestalt psychology. (3)

These images were flashed upon the screen for intervals of one-tenth of a second; the students standing at specially constructed drawing stations, drew in the absolute dark with large chalks on sheets of 18" x 24" paper.

This drawing laboratory was used for instruction as well as for research for many years. At the time of Hoyt's tenure, all dental majors were required to take his course in order to sharpen their visual skills when dealing with the perceptual problems of the human mouth in dental practice. In addition they sculpted very small objects to integrate this learning in seeing with the necessary three dimensional skills needed to design teeth.

This writer conducted a research study with Hoyt (Sherman and McWhinnie), 1972) that used architecture students in the experimental condition when compared to a group of controls. We found that a one quarter course in his drawing lab did significantly improve the students' skills to perceive and treat form, perceptual wholeness, and the ability to deal with space. These were all skills which the architecture faculty felt to be essential in a program of architectural education. The experimental groups did significantly better than a group of controls. (Both groups were architecture students.) This was one of the few experiments which tried to show that the Sherman method was superior to alternative educational strategies, such as the more traditional modes of instruction in drafting, perspective drawing, and three dimensional space development exercises. Sherman's experimental treatment was compared to the traditional mode for

architecture students to learn methods of drawing.

Sherman and Art Education

The idea of perceptual learning in art education in the 1960's was sparked by the ideas of June McFee (1961) who in her book did not recognize or even mention the work of Hoyt Sherman. He was just not a part of main stream art education. The subject of the teaching of drawing has been a neglected topic within art education of late years. Hoyt Sherman made a major contribution to the whole question of how to teach people to think visually in drawing and Sherman's contribution was never recognized by the art education profession. While McFee (McFee, 1957) based much of her PhD theory on the work of Ames and his research in perception psychology in the 1950's, she failed to note the work of Sherman.

Recent Emphasis on the Teaching of Drawing

There is a new interest in drawing as non-verbal cognitive skill. (Eisner, 1984) Many of the new proposals for the teaching of drawing as a cognitive skill seem to neglect the foundational work developed by Sherman in the 1940's.

I think that Hoyt Sherman had a very active program in perceptual learning in art long before either Arnheim (1954) or McFee (1961) published their important insight into the nature of perception and the visual arts. Sherman's lab was probably the best conceptualized, longest running, and the most comprehensive program in perceptual learning in art for the teaching of drawing. Its only rival was the program of process feedback pioneered by Ken Beittel at Penn State University.

What Sherman may have been doing 50 years ago was to teach his students to draw from the right side of the brain. (4) Yet, with the current interest in this

general topic and the work of Edwards (Edwards, 1978) he is given little credit or notice.

What were the instructional variables address by Sherman in his method of teaching drawing? It seems that Sherman attempted to do the following:

1. By drawing in the dark the student could not see the paper. This process discouraged the "I can't draw attitude". This is somewhat similar to Edward's method of drawing and copying a drawing upside down.

The point here in both Sherman and Edwards method is to devise a method in which the beginning student will be forced to suspend a negative attitude towards their lack of ability in drawing. Both Sherman and Edwards realized that one of the first psychological blocks to drawing is the feeling that one can't draw.

2. Within Sherman's system he forced the students to draw the negative space as well as the objects that they were looking upon.

Edwards also make the use of negative space as a primary mode of learning to see. She has her students draw chairs by drawing the space about the object rather than the object itself.

3. Sherman focused on whole perception and developed perceptual acuity. Students even drew the cracks in the slides as well as the images on the slides.

The emphasis on the instant perception of the whole gestalt caused them to make no differentiation between the abstract images and the accidental cracks in the glass slides.

Sherman's Influence on his Students

One of Hoyt's students, Don Kerr of the Art Department of the University of Nevada some years ago set up a flash lab at his University. He conceptualized art education as perceptual retraining. Kerr's program focused on the following objectives in drawing to help the student overcome:

a. inability to generalize

b. lack of proportional relationships

The inability to generalize visual forms, to see similarities and differences is at the very heart of the artistic vision. Sherman's method forced the students to deal with the perceptual relationships in the visual forms.

c. misjudgement due to depth

d. poor brightness discrimination

e. little sense of unity or composition

4. Sherman forced the students, as his title implies, to learn to draw by learning to see, to emphasize perception over cognition.

Although I have no comparative evidence in the form of experimental data, it has long been my impression that the Sherman method was the more powerful treatment. The Edwards system has the advantage of not having to need special equipment such as a flash lab, and in it one does not need to learn to draw in the dark!

In 1988 I conducted an in-depth interview with Betty Edwards and she readily acknowledged that Sherman's methods were very important for the development of her own ideas. She used the Sherman book in her teaching in the early 1970's and realized the possible connections between Sherman's ideas, her own research, and the research being done on the nature of the brain. As a part of his basic teaching

method, Sherman had his students draw rotating forms seen in space under different lighting arrangements.

Kerr's program has a carefully planned sequence of drawing experiences to work on these various learning problems combined with learning to see and learning to draw. The Kerr laboratory at the University of Nevada at Reno was closely modeled after the Sherman Lab at Ohio State which is no longer in existence. Several dissertations studies including Professor Kerr's own research made use of this facility. Kerr closely followed the plans which Sherman published in "Drawing by Seeing" and he developed a set of slides from the Sherman originals as published in that book. James Schulze of the University of Nevada did a doctoral dissertation some years ago which used the flash lab that Kerr had set up at the University. He developed and tested out the course that Kerr had adopted for the University and demonstrated some dramatic results with his students.

Other students have been dedicated to Hoyt's work and memory. Michael Torlen of the Art Department of New York State University at Purchase, New York have been strongly influenced by Hoyt's ideas in his teaching and art work and participated several years ago in a show in Colorado of the work of former Sherman students. (5)

There was also a flash lab set up at the University of Georgia in Athens, Georgia where several former Hoyt Sherman's student pioneered in the teaching of drawing-by-seeing. Leonard Edmondson who took his PhD degree at Ohio State, developed the Athens Lab and it too was closely modeled upon the concept and plans put forth in Hoyt's book. To my knowledge there are the only two such drawing labs in this country. (6)

SUMMARY

What are the contribution of Hoyt Sherman to Art and Design in America? He was an highly intuitive individual and was pioneering in two areas:

a. color perception

b. perceptual learning in art

Sherman made his major contributions through teaching about the fundamental problem of how to teach one to learn to draw. He should be viewed as a significant art educator because he was on the very forefront of the entire perceptual or gestalt psychology movement in art and design. The Sherman method for teaching drawing-by-seeing fulfills many requirements of what would seem to be a very powerful treatment. These are:

1. it is well grounded in psychological theory;
2. it has been tried and used successfully for 25 years in the teaching of drawing;
3. it is well grounded in a study of the drawings of past and present masters; and
4. it is very strong and dynamic way of teaching drawing.

The central question which this and other studies have raised is why are the treatment effects so difficult to assess and measure? A second question is, does this method depend on Sherman himself?

The inherent power of the treatment as well as the fact that on an impressionistic level it does seem to work and works very well; makes further attempts to solve the very realistic measurement and methodological problems worthwhile. The basic problem of this and other studies in perceptual learning in art is the question of relevant criterion measures. We need to develop better means of measuring psychological effects on variable which are relevant to the nature of art and to the artistic processes.

Reference Notes

1. Maybe Hoyt Sherman was really a forerunner of today's computer graphic programs. His color organ may have been a version of Claude Bragdon's color generating device developed in 1915-1920.
2. Other than his book, Sherman wrote little and published not at all. He was not trained as a researcher and hence needed the technical assistance of others to document what he achieved in the lab.
3. Some of these observations were prepared for a conference on the Teaching of Drawing that was held several years ago at the Maryland Institute in Baltimore.
4. Some of these observations were prepared for a conference on the Teaching of Drawing that was held several years ago at the Maryland Institute in Baltimore, published in a conference report in 1983.
5. Torlen has also used the golden section and Hambidge's methods of dynamic symmetry in his work. Was Hambidge an influence on Sherman? Sherman was studying art in the 1920s at the high tide of the Hambidge influence.
6. Sherman's research has been limited by the lack for published sources. Many of Sherman's students painted but did not write research articles and much of his influence has passed from generation to generation by verbal means.

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Definition of Terms

Aniseikonic - A malformation of the eyes in which right and left images are so varied in size that they cannot be readily fused by the brain.

Binocular Camera

Anamorphosis

Aniseikonic Lenses

Tachistoscopic Flashes